



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,638	01/28/2002	Benjamin P. Olding	M-12339 US	3448

32566 7590 11/28/2006

PATENT LAW GROUP LLP  
2635 NORTH FIRST STREET  
SUITE 223  
SAN JOSE, CA 95134

EXAMINER
----------

VIEAUX, GARY

ART UNIT	PAPER NUMBER
----------	--------------

2622

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/058,638	Applicant(s) OLDING ET AL.	
	Examiner Gary C. Vieaux	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-16, 20-24 and 32-34 is/are pending in the application.  
     4a) Of the above claim(s) 9-14, 21, 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 15, 16, 20, 22-24 and 32 is/are rejected.
- 7) ☒ Claim(s) 8 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Amendment***

The Amendment, filed October 30, 2006, has been received and made of record. In response to the most recent Office Action, dated August 31, 2006, claims 1, 8-15, and 20-22 have been amended, claims 5-7, 17-19, and 25-31 have been cancelled, and claims 32-34 have been added. The title has also been amended.

### ***Response to Amendment***

In response to Applicant's amended drawings, the Examiner finds the amended figures 1-3 to be properly designated as Prior Art, because only that which is old is illustrated, and therefore, this objection to the drawings is hereby withdrawn.

In response to Applicant's amended title, in light of the claim amendments regarding the use of selectively transmissive filters, the Examiner does not find the title to be more clearly indicative of the invention to which the claims are directed, and therefore, the objection to the title is not withdrawn.

In response to Applicant's amended claims 10 and 11, the Examiner finds the amendments to the claims to render the previous objections moot, and therefore, the previously indicated objections to claims 10 and 11 are hereby withdrawn.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection and/or election by original presentation.

### ***Drawings***

**Figure 10** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims, as amended, are directed.

### ***Election/Restrictions***

**Claims 9-14, 21, and 33-34** are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The enumerated claims are directed to composite filters for transmitting visible light of first and second color spectrums. This diverges from the other rejected and objected to claims, which are directed to separate and distinct filters.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for

Art Unit: 2622

prosecution on the merits. Accordingly, claims 9-14, 21, and 33-34 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Objections***

**Claims 1, 8, 15, and 20** are objected to because of the following informalities: each claim contains at least one instance of “transmissive filter” or “transmissive filters”. Please correct each instance to read “selectively transmissive filter” or “selectively transmissive filters” in order to create sufficient antecedent basis for each limitation. For purposes of evaluation of the claims on their merits, the claims will be interpreted to include the term “selectively”.

Appropriate correction is required.

### **CLAIM REJECTIONS**

#### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

24

**Claims 1, 22, and 32** are rejected under 35 U.S.C. 102(b) as being anticipated by Morimura et al. (US 4,630,106.)

Regarding claim 1, Morimura discloses an image sensor comprising a two-dimensional array of pixel elements, said array of pixel elements outputting pixel data representing an image of a scene (col. 4 lines 48-50; fig. 4(a)) and a two-dimensional array of selectively transmissive filters superimposed on said two-dimensional array of pixel

Art Unit: 2622

elements (fig. 4(b), col. 4 lines 53-55), whereby each pixel element in said array of pixel elements is disposed to capture a first and a second color spectra of visible light (fig. 4(b)), wherein said two-dimensional array of selectively transmissive filters comprises a two-dimensional array of filter cells, each filter cell superimposed and in registration with each of said pixel elements, each of said filter cells comprising a selectively transmissive filter of a first type and a selectively transmissive filter of a second type formed as four quadrants in an active area of said filter cell (fig. 4(b), col. 5 lines 31-36.)

Regarding claim 22, Morimura discloses a method for generating electrical signals representing an image in an image sensor comprising an array of pixel elements overlaid with an array of selectively transmissive color filters, comprising generating at each pixel element pixel data indicative of the light intensity impinging on said pixel element (col. 4 lines 48-55; fig. 4(b)), said pixel data being a sum of the light intensity of a first color spectrum and a second color spectrum of visible light (col. 5 lines 31-41; fig. 4(b)), wherein said array of selectively transmissive filter comprises a CMYG (cyan, magenta, yellow, green) filter pattern (fig. 4(a)) and said first color spectrum comprises a cyan color or a yellow color and said second color spectrum comprises a green color or a magenta color (fig. 4(b).)

Regarding claim 24, Morimura teaches all of the limitations of claim 24 (see the 102(b) rejection to claim 22 supra) including wherein said pixel element generates analog signals as pixel data (fig. 13, col. 4 lines 39-42 - employing NTSC, an analog video standard.)

Regarding claim 32, Morimura teaches all of the limitations of claim 32 (see the 102(b) rejection to claim 1 supra) including wherein said array of selectively transmissive filter comprises a CMYG (cyan, magenta, yellow, green) filter pattern, each filter cell having the transmissive filter of the first type and the transmissive filter of the second type selected from the CMYG filter pattern (fig. 4(b).)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 2-3, 15-16, and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Morimura et al. (US 4,630,106) in view of Fowler et al. (US 5,461,425.)

Regarding claim 2, Morimura teaches all of the limitations of claim 2 (see the 102(b) rejection to claim 1 supra) except wherein said two-dimensional array of pixel elements comprises a two-dimensional sensor array of digital pixels, each of said digital pixels outputting digital signals as pixel data.

Nevertheless, Fowler teaches a two-dimensional sensor array of digital pixels, each of said digital pixels outputting digital signals as pixel data (figs. 1 and 2, col. 2 lines 47-54.) It would have been obvious to one of ordinary skill in the art to combine

the digital pixel array as taught by Fowler with the filters as taught by Morimura in order to create a low-power consuming image sensor ('425 – col. 2 lines 24-25.)

Regarding claim 3, Morimura and Fowler disclose all of the limitations of claim 3 (see the 103(a) rejection to claim 2 supra) including wherein each of said digital pixels comprises a photodetector generating an output signal ('425 – fig. 2, col. 2 lines 47-54), and said image sensor further comprises a plurality of analog-to-digital conversion (ADC) circuits located within said array of pixel elements, each of said ADC circuits being connected to one or more photodetectors for converting said output signal digitized pixel voltage signal ('425 – figs. 1 and 2, col. 2 lines 47-54.)

Regarding claim 15, although the wording is different, the material is considered substantively equivalent to claim 2, as discussed above.

Regarding claim 16, Morimura and Fowler disclose all of the limitations of claim 16 (see the 103(a) rejections to claims 2 and 15 supra) including wherein each of said pixel elements comprises a photodetector generating an output signal ('425 – fig. 2, col. 2 lines 47-54), and said image sensor further comprises a plurality of analog-to-digital conversion (ADC) circuits located within said sensor array, each of said ADC circuits being connected to one or more photodetectors for converting said output signal digitized pixel voltage signal ('425 – figs. 1 and 2, col. 2 lines 47-54.)

Regarding claim 23, Morimura teaches all of the limitations of claim 23 (see the 102(b) rejection to claim 22 supra) except wherein said pixel element generates digital signals as pixel data.



Nevertheless, Fowler teaches a two-dimensional sensor array of digital pixels, each of said digital pixels outputting digital signals as pixel data (figs. 1 and 2, col. 2 lines 47-54.) It would have been obvious to one of ordinary skill in the art to combine the digital pixel array as taught by Fowler with the filters as taught by Morimura in order to create a low-power consuming image sensor ('425 – col. 2 lines 24-25.)

**Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Morimura et al. (US 4,630,106) in view of Examiner's Official Notice.

Regarding claim 4, Morimura teaches all of the limitations of claim 4 (see the 102(b) rejection to claim 1 supra) including disclosing wherein each of said pixel elements of said image sensor generates analog signals representative of said image as pixel data (fig. 13, col. 4 lines 39-42 - employing NTSC, an analog video standard.) However, Morimura does not expressly disclose said image sensor further comprises an analog-to-digital converter for digitizing said analog signals.

Nevertheless, Official Notice is taken regarding the generation of analog signals from pixel elements in an image sensor, as well as the inclusion of analog-to-digital converters with the image sensor for digitizing said analog signals; practices and concepts that are well known and accepted in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to take the analog signals generated by the image sensor and convert them to digital signals for the purpose of digital image processing and digital image storage of the images created by the image sensor of Morimura.

***Allowable Subject Matter***

**Claims 8 and 20** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 8 and 20, the prior art is not found to teach or fairly suggest, in combination with the claims from which dependence is derived, an image sensor wherein, in each filter cell, said selectively transmissive filter of said first type occupies a first quadrant and a second quadrant diagonal from said first quadrant.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sone et al. US 4,403,247) discloses combining color filter elements.

***Contact***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary C. Vieaux whose telephone number is 571-272-7318. The examiner can normally be reached on Monday - Friday, 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen T. Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2622

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gary C. Vieaux  
Examiner  
Art Unit 2622

Gcv2

  
NGOC YEN VU  
SUPERVISORY PATENT EXAMINER